



Apollo V Meets Most Goals In Switch to Alternate Plan

Despite having to shift to alternate mission plans, Apollo V January 22 met most of the primary mission objectives. An early shutdown of the first burn of the descent stage engine of Lunar Module 1 forced the adoption of Alternate Mission "Charlie", thus allowing ground controllers to bypass the problem and exercise both LM-1 engines

for most of the planned burn durations.

Tracking of the vehicle was intermittent after the second ascent stage burn and the extended mission phase—a period in which LM systems were to have been monitored and exercised through their expected lifetimes — was terminated at some 11 hours ground elapsed time.

Apollo V lifted off Launch Complex 37 at 4:48:09 CST following holds in the countdown caused by LM environmental control system temperature fluctuations due to ground support freon flow and by a problem in a power source for the Digital Data Acquisition System at the pad.

The launch phase followed closely the pre-planned sequence with insertion into orbit occurring at 10 min 03 sec after liftoff. Jettison of the aerodynamic shroud and deployment of the Spacecraft/LM Adapter (SLA) panels took place as programmed.

Following separation of the LM from the S-IVB second stage over the Carnarvon, Australia station of the Manned Space Flight Network, the S-IVB stage underwent a "passivation" experiment in which residual propellants were dumped through the J-2 engine. The experiment is a forerunner of procedures for making the S-IVB habitable and purged of propellants for future orbital workshop missions.

During the first pass over the Houston area, eyeball sightings were made of the LM, S-IVB and nosecone as they, still in sunlight, passed over Houston after nightfall.

The first ignition of the Descent Propulsion System at 10 percent throttle took place as planned at 3:59:37 GET over Carnarvon on the second pass, but was followed by shutdown four second later as insufficient propellant inlet pressures were sensed by the LM guidance system.

Spacecraft systems were thoroughly checked out during the subsequent stateside pass to determine the cause of the shutdown. Discussions between Flight Director Gene Kranz, Mission Director William C. Schneider in Mission Control Center and Apollo Spacecraft Program Office manager George M. Low at Kennedy Space Center brought the decision to switch to Alternate Mission C—a scheme whereby constraints in the LM guidance system would be bypassed and engine burns would be controlled by the LM Program Reader Assembly (PRA).

PRA Sequence III was cued up during the next pass over the tracking ship *Rose Knot*, offshore of California, at 6 hrs 10 min GET. The sequence ignited the descent engine for two separate burns starting at 10 percent throttle for 26 seconds and increasing to 100 percent. Two seconds into the second 100 percent throttle plateau, the "fire-in-the-hole" abort staging took place as programmed and the ascent engine ignited for a 60-second burn. The second ascent engine burn was deferred until the following Hawaii-stateside pass one revolution later.

LM-1's orbit after the first ascent engine burn was 92 nm perigee by 526 nm apogee.

(Continued on page 3)

NAR To Quote On Four More Apollo C/SMs

NASA has requested North American Rockwell's Space Division, Downey, Calif., to submit a proposal for four additional basic Block II Apollo spacecraft command and service modules.

The action would bring the total purchase of Block II's to 19 for flights on Saturn IB and Saturn V launch vehicles.

The four additional spacecraft (numbers 116-119) would be delivered starting in 1970.

The Space Division also manufactures the million-pound-thrust second stage (S-II) of the Saturn.

Congress Gets NASA Budget

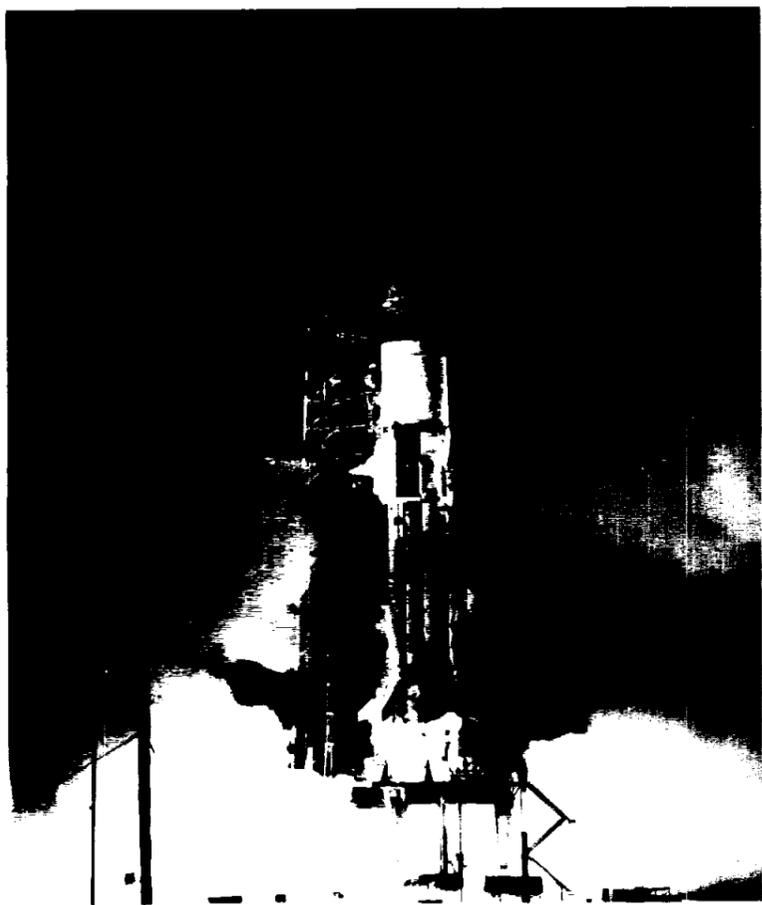
President Lyndon B. Johnson Monday presented the national budget to Congress for fiscal year 1969 which includes a \$4.37 billion request for NASA programs and operations.

Of this amount, \$3,677,200,000 were requested for research and development, \$45 million for construction of facilities, and \$648,200,000 for administrative operations—a total FY 69 request of \$4,370,400,000. The NASA FY 68 authorization was \$4,648,773,000.

The President's budget requests \$2,483,400,000 for manned space flight—about 54 percent of the overall NASA budget request. Manned space flight in FY 68 was authorized \$2,809,200,000.

Program break-out for the manned space flight budget is \$2,038,800,000 for Apollo, \$439,600,000 for Apollo Applications and \$5 million for advanced mission studies.

A total of \$3.1 million has been requested for construction of facilities at MSC—\$1.5 million for modifications to the Space Environment Simulation Laboratory and \$1.6 for an addition to the flight crew training facility. The FY 69 administrative operations request for MSC is \$97,096,000, and the requested ceiling for permanent MSC civil service positions remains unchanged at 4,579 spaces.



TWILIGHT LAUNCH—The Apollo V uprated Saturn launch vehicle and its Lunar Module-1 payload lifts off Kennedy Space Center Launch Complex 37 at dusk January 22 en route to what turned out to be a classic exercise in real-time flight planning on the part of the flight control team in Mission Control Center.

Hjornevik Takes Post As Associate Director

Creation of two new positions to strengthen top-level management at the Manned Spacecraft Center January 19 was announced by MSC Director Robert R. Gilruth.

Wesley L. Hjornevik, 41, has been named to the new position

of Associate Director and will assist the Director and Deputy Director in the overall management of MSC. Hjornevik, a veteran of 18 years of government service, nine with NASA, will be responsible for overall MSC organizing and staffing, MSC-contractor relationships, and inter-center contacts.

Succeeding Hjornevik as Director of Administration is his former deputy, Philip H. Whitbeck, 44. Whitbeck will supervise those administrative and technical services support functions required by MSC, including personnel, financial management, management analysis, and other supporting administrative services. This also includes the supervision of technical shops, the photographic laboratory, and the support engineering effort.

Dave W. Lang, 47, has been named to the newly-created position of Director of Program Control and Contracts. Lang, formerly Chief of MSC's Procurement and Contracts Division, will be responsible to Associate Director Hjornevik and will be in charge of planning, analyzing, and coordinating those procurement, contract, and budget requirements necessary for the support of MSC's major spacecraft programs.

Dr. Joseph A. Kratochvil will leave his job as Chief of the Resources Management Division to become Deputy Director of Program Control and Contracts.

William A. Parker succeeds Lang as Chief of the Procurement and Contracts Division with responsibility for all center procurement requirements except those major research and

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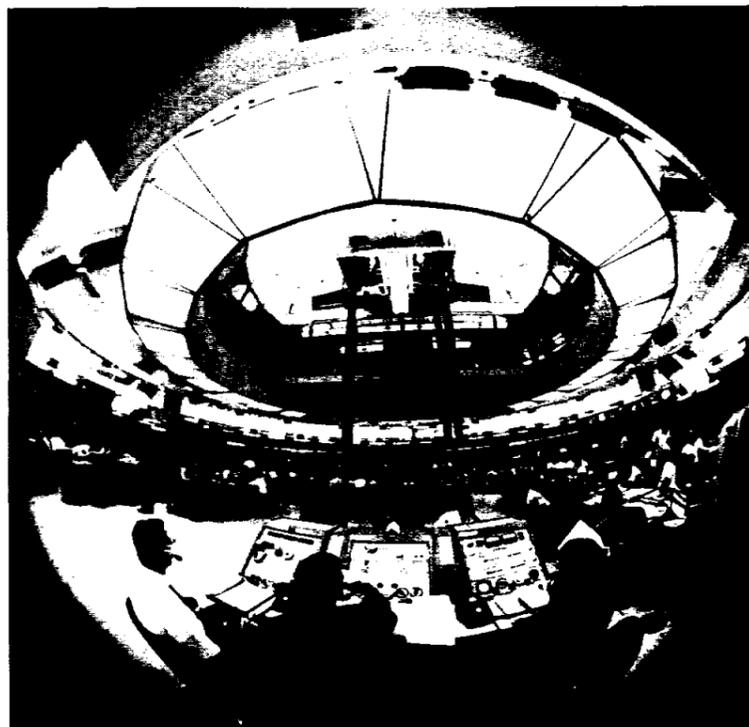
Blood Bank Sets Six Needle Days

Blood collections for the MSC Blood Bank will be made on six days this month at MSC and contractor firm locations. The hours of operation of the Blood Services of Houston bloodmobile will be from 8:30 am to 1 pm.

Dates and locations of blood collection are as follows: February 19—MSC Bldg 8; February 20—General Electric; February 21—MSC Bldg 8; February 26—Ellington AFB Bldg 276; February 27—Msc Bldg 8, and February 28—Lockheed Building.

MSC and contractor employees wishing to join the MSC Blood Bank should contact one of the following persons: Ed Stelly, MSC Ext 3378; Bill Averyt, B&R-N HU 8-2500; Jim Hallmark, NAR HU 8-2720; Ed McCabe, GE 932-4511, Ext 2133; Jerry Holder, Lockheed HU 8-0080; Al Schneider, Dynalectron Ext 7630; Sara Weyer, Boeing 591-5285, and Larry Salyers, AT&T HU 8-1010.

Blood in the MSC Blood Bank is better than money in the bank, for blood can be transfused but money cannot. Moreover, an account in the MSC Blood bank is insurance against an emergency in one's family.



WEARY COUNTDOWNERS—The photographer's fisheye lens captured a large portion of the scene in KSC Launch Complex 37 blockhouse during the Apollo V countdown. Two lengthy holds in the count were caused by problems in ground support equipment. (More Apollo V photos page 3.)

20 Year Service Awards at RASPO-Downey



CENTURY OF COMBINED SERVICE—MSC RASPO-Downey employees receive their 20 Year Service Award certificates and pins from RASPO-Downey manager W. H. Gray, third from left. The five are, left to right: Anthony Retrosi, Joe Campbell, Gray, Leland Fuller, Fredrick Bailey and Arthur Littrell.

Apollo VI Trip to Pad Scheduled Next Week

Testing and preflight preparations for upcoming Apollo missions rolled ahead on several fronts this week at Kennedy Space Center, MSC and at the Naval Air Facility, El Centro, Calif.

Rollout of the Apollo VI spacecraft and its Saturn V launch vehicle from the Vehicle Assembly Building to Launch Complex 39 at KSC is expected sometime next week. Flight controller teams this week began Apollo VI launch simulations in Mission Control Center.

At MSC, Apollo command module flammability testing with a mixture of 60 percent oxygen and 40 percent nitrogen at 16 psi was completed. The tests showed that the command module was generally well protected against fire while indicating a small number of areas where additional protection is needed. A total of 31 tests were run in

the 60/40 atmosphere between January 15 and 25.

Two tests of the Apollo earth landing parachute system were scheduled this week at the Naval Air Facility, El Centro, Calif. The first test was to have been a strength-verification test of a single Apollo main chute in the first stage of reefing. The chute was to have been dropped with a 9500-pound test weight and deployed at 10,000 feet.

A high-altitude deployment test of the Apollo drogues was scheduled today with a 13,000-pound test weight and dropped from an altitude of 50,000 feet. The test will simulate crew manual deployment of the drogues which normally open automatically at about 25,000 feet. Today's test will deploy the drogues at about 40,000 feet.

Bay Chorus Sings Mozart Requiem With Symphony

The Bay Area Chorus' March 31 performance of the Mozart Requiem as an Astronaut Memorial Concert in the MSC Auditorium will be accompanied by 30 members of the Houston Symphony. A grant from the Recording Industries Performance Trust Fund, administered by the Houston Professional Musicians Associations, will finance the orchestral accompaniment.

Some 40 new singers have joined the Chorus since rehearsals began for the Requiem, bringing the total to almost 100 voices. Members come from the MSC area as well as from La-Porte, Dickinson, Friendswood, Clear Lake City and Pasadena. Paul Harrison of Seabrook directs the Chorus.

Apollo Guidance Pact Extended

MSC has awarded a two-month contract extension to the Massachusetts Institute of Technology, Cambridge, for work on the Apollo spacecraft guidance and navigation system.

Estimated value of the cost-reimbursement, no-fee contract extension is \$2 million.

Under the contract MIT is responsible for design and developmental support of the Apollo command module and lunar module guidance and navigation systems, including flight test and operational support.

Work under the contract will be performed through Feb. 29, 1968, by MIT's Division of Sponsored Research at Cambridge.

This extension brings the total estimated value of the MIT contract since April 1965 to \$48,706,850.

**JIM THRIFT SAYS:
FIGHT
WASTE!**



**JOIN THE...
COST REDUCTION TEAM**

Hjornevik Promoted

(Continued from page 1)

development programs for spacecraft and closely related equipment. This includes procurement activities in support of advanced missions, on going center operations, support contractor operations and other facilities, equipment, and supplies required for center operation.

Russell C. Connelly replaces Kratovil as Chief of the Resources Management Division. Connelly had previously been deputy division chief.

Gilruth has also selected Aleck C. Bond, 46, to head two staff offices—Flight Safety and Reliability and Quality Assurance. Bond has been manager of systems tests and evaluation in the Engineering and Development Directorate.

The New Reliability and Quality Assurance Office consolidates the activities of several existing organizations. The majority of the R&QA personnel is from the Reliability, Quality and Test Division of the

Apollo Spacecraft Program Office and from the Quality Assurance Branch formerly assigned to the Flight Safety Office.

Responsibility of the new office is to establish reliability and quality specifications for new manned space programs as well as to insure that current programs meet established quality and reliability levels.

Flight Safety Office will spell out the policies and procedures and will conduct continuing systems analysis from the standpoint of safety. It will advise program managers and the MSC director on all matters relating to flight safety.

The former head of the Flight Safety Office, F. John Bailey, Jr., has moved to the Kennedy Space Center, Florida, as Chief of Flight Safety Operations responsible to the MSC Flight Safety Office.

Bond's deputy for R&QA will be William M. Bland, Jr., who has been Chief of the R&Q Test Division, ASPO.

Banjo Pickers Highlight Go-Texan Saloon Show

The February 7 Go Texan Western Steak Dinner & Saloon Show last week signed the Jesse Armstrong Banjo Pickers to headline a fun-filled entertainment bill.

Armstrong and his three strong-fingered cohorts will lead the largest and loudest sing-along in Clear Lake history during the evening's festivities at the Nassau Bay Hotel.

Saloon Show Entertainment Chairman Robert Jones signed the Armstrong group after auditioning upwards of 50 banjo plucking groups. "It was their kazoo player that tipped the decision in favor of this group," Jones told the Roundup.

In addition to an old-fashioned steak dinner for \$3 a person, the

evening will include the banjo group, a variety of door prizes, Pantomimist Dorthy Szopski, a tape of famous radio-television "breakups" and free beer. The beer was donated by Frank Horlock of Pearl Beer and Wimpy Wismer of Budweiser.

Activities get under way at 6:30 pm when a cash bar opens. Dinner is at 8 pm with the show getting started at 8:30 pm. About 50 tickets were left at Roundup press time, according to Ticket Chairman Betsy Bednarczyk, HU 3-4588 or 591-3300.

Here is a complete rundown on the NASA area events:

February 3—Western dance at 7 pm Buffet included. Tickets are \$3.75 per person. For information, call Jackie or Sam Sanborn at 591-3049 or HU 3-5491.

February 7—Saloon show. Traditional western dinner of steak and beans. And some very special entertainment. All for \$3 per person. Cash bar available. Call either Paul or Jan Haney at HU 3-3671, HU 3-2253 or 946-6327.

February 21—Go TEXAN Day in NASA-Clear Lake area. Everyone urged to dress western style.

LM-2 Shipment Delayed Pending Apollo V Review

Shipment of the second Apollo Spacecraft Lunar Module and the associated Saturn IB rocket to the John F. Kennedy Space Center, Florida, has been postponed pending further evaluations of Apollo V Mission results.

Initial evaluation of the first Lunar Module flight on January 22-23 indicates that a second unmanned flight may not be required to qualify the spacecraft for flight with men aboard.

Further detailed review of Apollo V flight data and deliberations by a NASA Design Certification Review Board in March will determine the final decision.

Lunar Module II and the Saturn IB stages will be maintained ready for shipment to Cape Kennedy on three and 14 day notices respectively.

Spanish Group Offers Classes

The MSC Spanish Club is forming classes in beginning and advanced Spanish conversation. The classes will be discussed at the Club meeting Monday at 5:15 pm in Room 108 Bldg 13.

MSC and contractor employees interested in taking the courses should attend the meeting. Jose Perez at 5431 has further details.

Apollo V Mission Events

Event	Planned	Actual
Liftoff	1:00:00 CST	4:48:09 CST
Inboard engine cutoff	02:21 GET	02:19 GET
Outboard engine cutoff	02:24	02:22
S-IVB J-2 engine start	02:27	02:24
S-IVB J-2 engine cutoff	09:58	09:53
Orbital insertion	10:08	10:03
Perigee/Apogee	88/118 nm	87.6/119.5 nm
LM/S-IVB separation	54:32	53:55
Descent Propulsion System Burn No. 1 3:59:37 (shutdown after 4 sec)		

Alternate Mission C:

Program Reader Assembly Sequence III start	6:10:04 GET
DPS No. 1 burn @ 10% throttle	6:10:43
DPS No. 1 burn @ 100% throttle	6:11:09
DPS-No. 1 cutoff	6:11:15
DPS No. 2 burn @ 10% throttle	6:11:48
DPS No. 2 burn @ 100% throttle	6:12:12
Fire-in-the-hole abort staging/APS-1 ignition	6:12:14
APS-1 cutoff	6:13:14
Resulting perigee/apogee	92/526 nm
PRA Sequence V start	7:44:21
APS-2 ignition	7:44:35
APS-2 cutoff (depletion)	7:50:30

Apollo V Meets Goals

(Continued from page 1)

PRA sequence V was commanded to begin during the next Hawaii pass at 7 hrs 44 min GET. The ascent engine ignited for its second burn and ran until propellant depletion—about 6 mins 23 sec.

Attitudes during the second ascent engine burn apparently were such that LM-1's orbit began to decay, for in the ex-

tended mission period, ground stations got only intermittent tracking and indications were that LM-1 likely reentered in the South Pacific during the sixth revolution.

At the post-mission press conference, Apollo V Flight Director Gene Kranz gave recognition to the many people involved in mission control support.

"The simulation people I think did an outstanding job from the standpoint of training us to handle these types of contingencies and alternate mission planning we had worked out," said Kranz. "And the Mission Planning and Analysis Division—particularly Stan Mann and Aldon Berdono, as well as many of Carl Huss' people—did an excellent job of

providing us trajectory support for this plan. We had some outstanding mission engineers—Bill McKenzie, Jim Tomberlin, Bill Fisher and Dan Lockard. I'd estimate we transmitted at least a thousand commands during the course of the mission, and that system never faltered."

MSC Director of Flight Operations Christopher C. Kraft, Jr. added, "I think that we achieved almost all of the goals we had set out for ourselves here. We got two descent propulsion system burns. We got fire-in-the-hole staging under the thrust of the descent propulsion system, and we got an ascent propulsion burn to depletion. All of these things are important to us and I think have proven to use that, based on the data we will have to analyze later, that the spacecraft in fact did perform extremely well. It appears that the descent propulsion engine as well as the ascent propulsion engine also performed very well. The one thing that we did not get from the flight was control of the engine under the LM guidance computer. We will have to evaluate how important that is."

NASA Associate Administrator for Manned Space Flight Dr.

George E. Mueller commented, "The performance of the flight control crew and the launch control crew today was superb. They did in fact snatch success from what might have been a not very successful mission. They were able to do this because of the careful planning that went into the preparation for this mission—the alternates that Gene Kranz described—surely would not have been possible except for the careful planning and all of the work that went into making the mission finally a success."

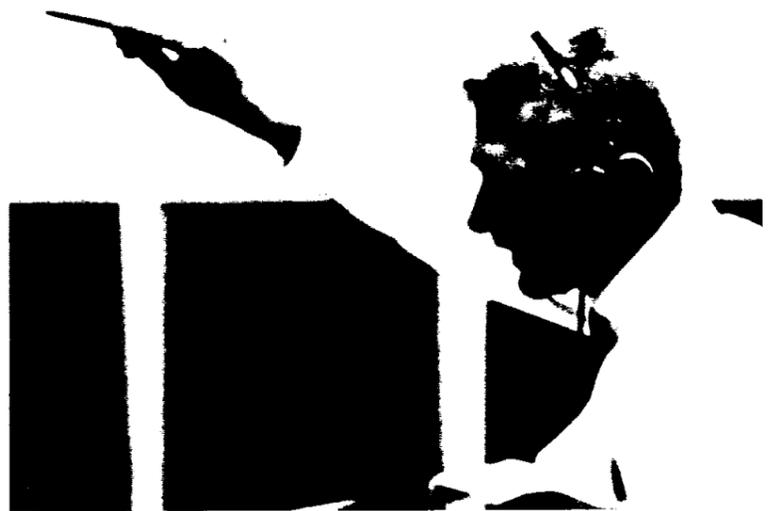
"I don't like to fly unmanned missions, particularly with hardware designed to carry men," said Apollo Spacecraft Program Office Manager George M. Low. "LM-1 in this flight met and exceeded my expectations. This was due to the fact that we had a good piece of hardware; it was due to the fact that we had outstanding flight control teams under Gene Kranz' able leadership. I guess I feel like Chris Kraft does. I hope that our data evaluation will confirm and will show that with this flight and with some additional ground tests that are planned, we are ready to fly men in the LM."



MISSION HUDDLE—Alternate Missions "Charlie" and "Item" and the potentials of each are discussed at the Apollo V flight director's console after early shutdown of the first descent propulsion system burn. Left to right are mission engineer James L. Tomberlin of ASPO Systems Engineering Division, mission director William C. Schneider, Apollo V flight director Gene Kranz and MSC Director of Flight Operations Christopher C. Kraft, Jr.



TROUBLESHOOTERS—The Guidance and Control Officer's console was a busy place as flight controllers attempted to sort out the reasons for early shutdown of the LM-1 descent engine. Here Jack Craven, Robert L. Carlton and Jim Saultz examine data recordings.



MAESTRO KRANZ—Apollo V flight director Gene Kranz directs a well-rehearsed orchestra of flight controllers in a composition called real-time flight planning. The flight control team salvaged most of the mission objectives from what could have been failure by switching to a pre-planned alternate mission. But, what does one do for an encore?



Texas' granite capitol is a treasurehouse of state history in paintings, sculpture and documents

THE TEXAS CAPITOL is more than a seat of government; more than a fountainhead of laws. With its treasures of Texana, it acts like a lodestone upon even the "summer soldier and the sunshine patriot." And those who enjoy deeper drafts of history may stand again and again before the capitol's paintings, sculptures, and documents, each time finding something they had missed before.

Texans and tourists by the scores visit the capitol daily on an informal, drop-in basis. And every year, in the spring, it becomes a high-domed Mecca for formal student pilgrimages. In an average year, more than 20,000 Texas school children troop solemnly through the capitol corridors, pausing here and there to examine something which gives life to the pages of their textbooks.

Neither the casual nor the member of an organized group need go blindly and at random through the capitol. On the first floor, a receptionist will give any-

one who requests it a brief, general, written guide on where to look for points of interest. On the second floor, an employee of the Texas State Library endears herself to school children by passing out a facsimile of the State Seal, a picture of the capitol, a map of Texas, and a reproduction of Col. William B. Travis' stirring appeal for aid from the beleaguered Alamo.

In addition to these aids for visitors, school classes and other groups may avail themselves of a guided tour through the capitol conducted by Capitol Police Guards.

Appropriately enough, as a visitor enters the capitol he finds underfoot the names of Texas battles. Here, in metal letters set in the terrazo floor of the foyer, are recorded the battles which forged a Mexican province into a sovereign republic.

At the place of honor, at front and center, lies the name *Gonzales*, where the first battle of the Texas Revolution was fought on October 2, 1835, after the

Gonzalians refused to return a cannon to the Mexican Government. Not far away lies *Bexar*, commemorating the siege in December, 1835, in which Ben Milam was killed in the assault on San Antonio.

Studded about the foyer floor are reminders of other disturbances and battles which preceded the Revolution itself — names like *Anahuac* and *Velasco*, where as early as 1832 the colonists began to show signs of armed discontent against Mexican rule. Names like *Goliad* and *Coleta* recall the heroic efforts of patriots like George Collingsworth, James Fannin, Philip Dimmit, William Ward, and the martyred men who were massacred at La Bahia.

Then comes the *Alamo*, five simple letters in the capitol floor symbolizing the efforts of Travis, Bowie, Crockett and the other Texas immortals who enshrined themselves in the hearts of their countrymen by sacrificing themselves in a heroic, last-ditch stand against Santa Anna.

Rounding out the revolutionary period is *San Jacinto*, where in the brief space of 18 minutes Sam Houston and his army at last put the Mexicans to rout and won freedom for Texas.

But the roll call of battles on the capitol floor does not end here. Calling up the thunder of distant guns guring the Mexican War are *Palo Alto* and *Palmito*, both fought near the Rio Grande in the Texas-Mexico borderland. And reminiscent of the War Between the States are the battles of *Galveston* and *Sabine Pass*, the latter giving fame to the name of Dick Dowling.

Other treasures and memorabilia of the foyer come in pairs — two paintings, two statues, and two documents. On the right wall hangs a painting of David Crockett, U. S. Congressman from Tennessee, bear hunter, spinner of yarns, defender of the Alamo, and every schoolboy's hero.

Across from Davy's picture, on the opposite wall, hangs the oft-published painting of Santa Anna surrendering to General

Sam Houston. The time, of course, was April 22, 1836, the day after the battle. Houston rests beneath an oak tree on the battlefield, his injured ankle swathed in bandages. Before him, a prisoner, stands the crestfallen Santa Anna, garbed in the clothes of the common soldier, a disguise he had assumed in trying to escape. A sharp and knowing eye finds more than the principal figures clearly identified in this painting. For example, the brilliant scout, Deaf Smith, stands to one side, a hand cocked to one ear as he strains to listen.

Also in this front room are life-size statues in white marble of Stephen F. Austin and Sam Houston — both masterpieces from the talented hands of Elizabeth Ney, German-born sculptress who had received commissions from the royalty and great men of Europe before moving to Texas in 1872. The statues were originally created for the Texas Exhibit at the World's Fair in 1893, but only one was completed in time for the exhibit.

The document which claims the principal attention of visitors just before they leave the foyer is a photographic copy of the original Texas Declaration of Independence, signed at Washington-on-the-Brazos on March 2, 1836. This document was first deposited with the U. S. Department of State in Washington. It was returned to Texas in 1896, but was not displayed publicly in the capitol until March 2, 1930. It now reposes in the security of a steel safe in the Texas archives.

Across the room from the Declaration of Independence is framed a photographic copy of the Ordinance of Secession by which Texas joined the Confederacy. Sam Houston bitterly opposed secession, and refused to recognize the authority of the Secession Convention. The Secession Convention then deposed Houston as Governor. Quietly giving up his office, he retired to his farm near Huntsville and died on July 26, 1863.

The rotunda, or room directly under the dome of the capitol, is always a popular point of interest for visitors. Looking some 300 feet straight up, one has an uninterrupted view inside the great dome.

On the stone floor of the rotunda are arranged in circular order the seals of Spain, Mexico, France, the Republic of Texas, the Confederacy, and the United States. The "Texas star" occupies the center of this arrangement.



LOOKING NORTH FROM THE ROTUNDA - FROM FLORENCE

On the walls of the rotunda, beginning on the ground floor and circling clockwise and in chronological order up through several floors, are portraits of all Texas heads of state. These begin with portraits of Provisional Governor Henry Smith and President *ad interim* David G. Burnet. After them appear portraits of all full-time presidents of the Republic—Sam Houston, Mirabeau B. Lamar, and Anson Jones. Then, in the order in which they served, hang portraits of all Texas governors since J. Pinckney Henderson took up office in 1846.

BEFORE leaving the first floor, most visitors like to stroll down the corridor of the West Wing, which houses the offices and library of the Attorney General—elected for two years and often called “the people’s lawyer.” His office, which employs 44 lawyers, was created as a state office in 1845, taking the place of a similar office in the Republic.

Among the duties of the office are to give legal advice to the governor, department heads, state institutions, and the legislature. The Attorney General also represents the state before the Supreme Court and the Court of Civil Appeals. He examines and approves county, city, and special district bonds, serves on a number of state boards, and carries out a multitude of other legal duties.

Also on the first floor are the offices of the State Treasurer, elected to serve a term of two years. It is the duty of the treasurer to receive and keep state money, maintain accounts of receipts and expenditures, collect certain taxes, and serve as *ex officio* member of a number of state boards.

In a basement under the capitol, but not considered a part of it, is the treasury vault. Here, behind a massive 28-ton door, repose more than a billion dollars in securities, but not one cent in cash! The decision to keep no cash here and the security precautions around this vault may recall memories of June 11, 1865, when the Treasury Robbery took place. On that day, bandits broke into the treasury office, intent on stealing some \$300,000 in specie and U. S. coupons. Volunteers who pursued the robbers wounded several and captured one man. The rest escaped with only about \$1,700.

The visitor might well begin his tour of the capitol’s second floor with an inspection of the Governor’s reception room. At one end of this spacious room stands a beautiful mirror given to Texas by the French in 1889. Also in the reception room, and of considerable interest currently to school children of Texas, is the personal desk of David Crockett.

North from the reception room is the Texas State Library, first established in 1839 by joint resolution of the Third Congress of the Republic of Texas. Valuable books and manuscripts went up in smoke when the previous capitol burned in 1881, and the

long task of rebuilding the Library and its contents was begun in 1891, largely under the aid and influence of Gov. James Stephen Hogg. Historians, teachers, writers, and others interested in Texas history find the Library’s collections of Texana valuable sources of material. The Texas State Archives, a part of the Library, are housed nearby in another building.

ON THE SECOND floor are the two bodies of the legislative branch of state government. Occupying the west side of the building is the House of Representatives, whose 150 members are elected to serve a term of two years. All bills on taxation must originate in the House of Representatives, though other bills may originate in either the House or the Senate.

The Speaker of the House, who is elected by the membership occupies a rostrum at the front and center of the House. On the wall behind the Speaker and to his left is a portrait of Sam Houston. Immediately behind him is the original battleflag of Col. Sydney Sherman carried at San Jacinto. A female figure of Liberty adorns this flag, with the words “Liberty or Death” on a ribbon draped over a drawn sword. To the Speaker’s right is a portrait of James Stephen Hogg, first native Texan to be elected Governor.

Just across the building from the House is the Senate Chamber, whose 31 members are elected to serve a term of four years. Presiding over the Senate is the Lieutenant Governor, elected by a state-wide popular vote.

After passing through a small foyer which features portraits of prominent Texans, the visitor

enters the main Senate Chamber. On the rear wall of the Chamber, at the right, is H. A. McArdle’s famous painting, “Dawn at the Alamo,” a vivid canvas which captures all the furious action of the final assault. On the wall at the left is McArdle’s companion painting, painted in similar vein, of the “Battle of San Jacinto.”

On the right wall is a portrait of the lady who is sometimes called “the Betsy Ross of Texas.” She is Johanna Troutman, a Georgia girl who, in 1835, helped raise the Georgia Battalion which came to Texas under command of Col. William Ward. For the battalion, Johanna Troutman designed and made a flag of white silk, bearing a blue, five-pointed star and the words “Liberty or Death.” In the portrait, Miss Troutman holds the flag on her lap.

The third floor of the capitol is given over principally to the judicial branch of the government. At the north end of the building on this floor is the Court of Criminal Appeals, created by amendment to the Constitution in 1891, and presided over by three judges and two commissioners. This body has the distinction of being the first court of exclusive criminal appellate jurisdiction ever created.

On the west side of the third floor is the Texas Supreme Court. As established in 1845, the Supreme Court consisted of

a Chief Justice and two Associate Justices. Today, the Supreme Court is composed of nine justices and has civil jurisdiction only, exclusively appellate, with limited exception.

Apart from these two courts, the Texas judicial system is further composed of 11 Courts of Civil Appeals with three justices each; district courts, which are principal trial courts of original jurisdiction; county courts; and justice of the peace courts. In a sense, county commissioner’s courts might be considered a limited part of the judicial system, but the affairs of these courts are concerned only with fiscal and administrative affairs of the county.

A FITTING end to any tour of the capital is a brief stroll through the capitol grounds. Flanking the main walkway which leads up to the capitol from the head of Congress Avenue are four statues: The Confederate Dead Monument was erected in 1901. Bronze figures on its base represent President Jefferson Davis, three Confederate soldiers, and one sailor.

The Volunteer Firemen Monument was erected in 1896 by the State Firemen’s Association. A bronze figure on a granite base shows a fireman sheltering a frightened child in the crook of his left arm, with a lantern clutched in his right hand.

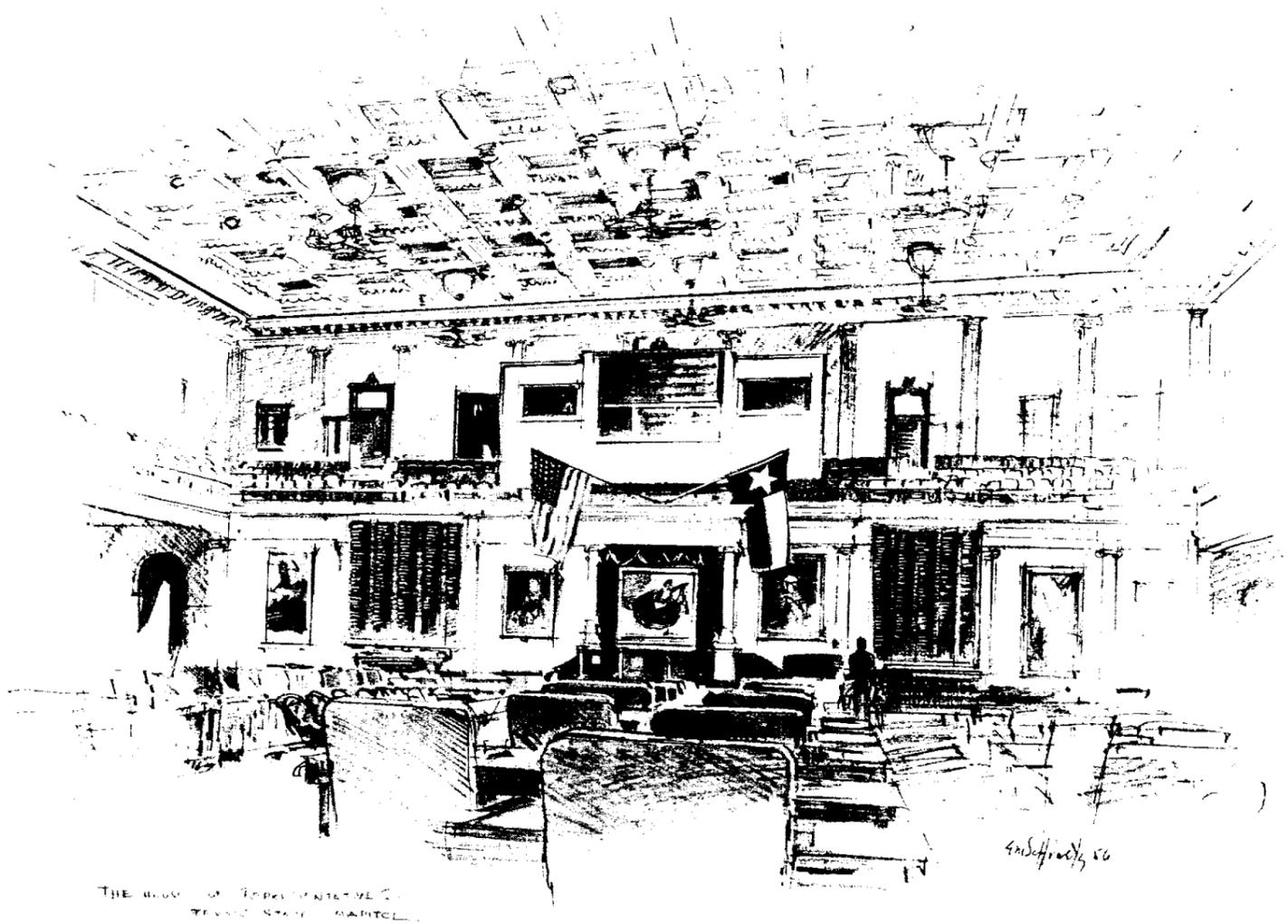
The Terry’s Texas Rangers Monument was erected in 1907 in honor of the Eighth Texas Cavalry, an independent unit of the Confederate Army. Across the walk from this monument is the Alamo Monument, erected in 1891, showing a young Texan holding a long rifle. On its four sides are written the names of those who died in the Alamo.

On the west lawn of the capitol is the Texas Cowboy Monument, presented to the state by its sculptor in 1925. It was first exhibited in Paris, and won acclaim there.

The Capitol Greenhouse, opposite the east steps, is open to the public. Near it, on the east lawn, is the Monument to Hood’s Brigade, a granite shaft topped by a bronze Confederate soldier.

Twin cannons—short, snub-nosed weapons—stand on each side of the south entrance of the capitol. These are not to be confused with the famous “Twin Sisters” which Houston’s army used with such devastating effect at San Jacinto. The capitol cannons, however, were used in the Texas Revolution and later in the Civil War. They were presented to the Republic of Texas in 1836 by Major General T. J. Chambers.

A tour of capitol and grounds such as the one suggested here takes time. But it is a richly rewarding experience and provides a full reservoir of memories to be enjoyed later. Here, in the hush of this stately building and its peaceful grounds, even the casual visitor must be impressed with the courage and unflinching zeal of those who made Texas a great state. And here, also, one must thrill to the feel of an undercurrent of the tremendous energy and vigor which continue to keep Texas great.



THE HISTORY OF TEXAS FROM ITS EARLIEST EXPLORATION THROUGH ITS COLONIZATION AND GROWTH INTO A REPUBLIC, AND FINALLY AS A STATE OF THE UNION, IS AN EXTREMELY INTERESTING HISTORY. THROUGH THE COURTESY OF HUMBLE OIL AND REFINING COMPANY, ARTICLES FROM HUMBLE'S TEXAS SKETCHBOOK WILL APPEAR IN THE ROUNDUP DURING THE NEXT SEVERAL MONTHS. THE ARTICLES WERE WRITTEN BY F. T. FIELDS. PENCIL SKETCHES AND WATERCOLORS ACCOMPANYING THE ARTICLES ARE BY THE NOTED TEXAS ARTIST E. M. "BUCK" SCHIWETZ. MANY OF THE PLACES DESCRIBED IN THE SERIES ARE WITHIN WEEKEND DRIVING DISTANCE OF MSC.

The history of Texas from its earliest exploration through its colonization and growth into a republic, and finally as a state of the Union, is an extremely interesting history. Through the courtesy of Humble Oil and Refining Company, articles from Humble's Texas Sketchbook will appear in the Roundup during the next several months. The articles were written by F. T. Fields. Pencil sketches and watercolors accompanying the articles are by the noted Texas artist E. M. "Buck" Schiwetz. Many of the places described in the series are within weekend driving distance of MSC.

For Science Scholarships



BENEFIT MOVIE—Mrs. Robert Gilruth and Mrs. George Low sell Webster State Bank vice president Gene Linquist ticket to the February 14 benefit showing at Clear Lake City Theater of "Any Wednesday." Proceeds from the showing will benefit the Achievement Rewards for College Scientists (ARCS) fund. Tickets are \$3.75 each and are available from Fran Carter in the MSC area at 591-2442 or 877-1189. Top door prize to be drawn after the movie will be a broadtail jacket with a mink collar.

Credit Union Straight Talk

By Paul Sturtevant

I keep on harping about interest rates, but it seems to be paying off! Ask a friend . . . I'll bet you'll find one who has looked into what he's paying "downtown" and has come to us to consolidate his "charge accounts". Never too late to ask us for help! And that's what your credit union is all about.

We need your money. We'll put it to work for you (dividends) and we'll help your fellow workers borrow at reasonable interest rates.

Some of you read my article about *DORMANT* accounts and have dropped by to deposit some money. Good for you and for us. Don't forget, you can get a lower interest rate by borrowing against your shares, so it helps you to have shares in your credit union.

How about that savings account? What have you done about it? Pennies, nickels, dimes, quarters, and halves get down the drain quickly. Save regularly. Pay yourself first. Use "round-trippers". Call 2066 so you can get started.

One question I seem to answer many times is . . . I can get a 5% auto loan, what can you people at the credit union do. We offer loans at 1% per month on the unpaid balance. With this loan you get loan protection insurance at no extra cost. You also have *NO PENALTY* for paying your loan ahead of the normal time period. Most contracts with commercial loan agencies require *FULL INTEREST* regardless off how soon paid off.

In addition, you often have to buy loan protection insurance. Check with us. It could cost you if you don't!

For the benefit of our members the MSC Credit Union will have a rep in cafeteria #1, bldg. #3 from 11.30 a.m. until 1.00 p.m., each Wednesday. You can make share deposits and loan payments by cash or check. No checks will be cashed and no loan applications will be accepted by this rep. Shares are \$5.00 each; however, you may

deposit any part of this amount.

The MSC Credit Union January 24 elected officers and directors for the 1968-1969 term. Directors elected were: Burney Goodwin, Paul M. Sturtevant, John Papal, Elizabeth Rogers, Clyde Waters, Harold Ferrese, James Moody, William Milam, and I. E. Campagna.

The new board of directors elected the following officers: President Burney Goodwin, Vice President Harold Ferrese, Treasurer Clyde Waters and Secretary James Moody. Elected to the Credit Committee were James DeMuth and O. A. Crow.

The *Roundup* is an official publication of the National Aeronautics and Space Administration Manned Spacecraft Center, Houston, Texas, and is published every other Friday by the Public Affairs Office for MSC employees.

Director Dr. Robert R. Gilruth
Public Affairs Officer Paul Haney
Editor Terry White
Staff Photographer A. "Pat" Patnesky

MINIMIZES FURTHER INJURY—

Floating Rescue Litter Among Four MSC Invention Patents

By Bob Gordon

A floatation device for use in air-sea rescue work is among the latest inventions developed at MSC to receive US patents.

The rescue device, developed by former MSC employees R. A. Pollard and Glenn Shewmake, incorporates floatation devices on a "Stokes"-type litter facilitating the rescue of an injured swimmer, or space pilot. Marvin Matthews, MSC patent counsel said it is one of four inventions developed by MSC or former MSC employees which recently received US patents.

Patents have also been issued to Kenneth D. Cashion and Benny R. Baker for a radiation detector readout system; R. R. Bilderback for an amplitude modulated laser transmitter; and R. L. Johnston for a multiple-environment materials test chamber.

The rescue device is designed to ease recovery of injured persons without causing further injury to the victim. To effect a rescue the litter, with floatation devices at each end, is dropped into the water by aircraft or rescue vessel.

The litter remains in a vertical position through the aid of the floatation devices. While the device remains in a vertical position the injured party is gently secured to the litter. The other floatation device is then inflated causing the litter to raise from

the vertical position to the horizontal position from which the injured party is then lifted from the water.

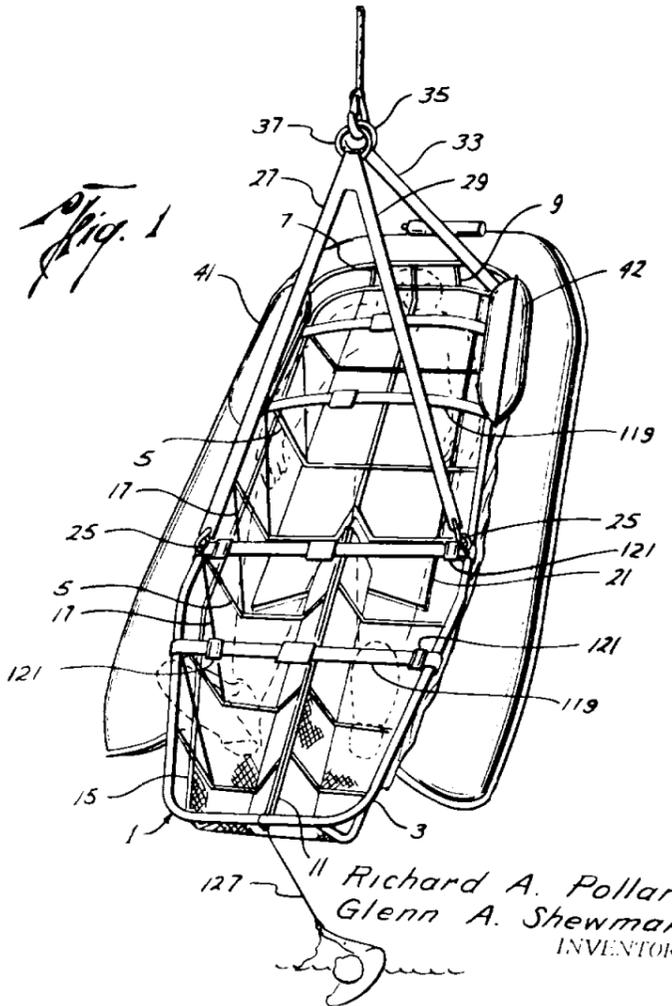
The patent describes the invention as being simple and one which minimizes further injury and affords immediate rendering of first aid. It also substantially precludes capsizing in high waves where prior litters could not be used.

This brings to approximately 40 the number of inventions by MSC employees to receive US patents during the last several years.

Today's Seminar On Cosmic Rays

Dr. Clifford L. Deney of the University of Rochester this afternoon at 2 will speak on "Cosmic Ray Research in the 50 to 250 MeV/n Energy Range at the University of Rochester."

An MSC space physics seminar, the program will be in Bldg 31 Conference Room (193) and is open to anyone with supervisory approval.



1st US Satellite Still in Orbit After 10 Years

Day before yesterday was the tenth anniversary of the launching of the United States' first payload into orbit.

Explorer 1, first US earth satellite, January 31, 1958 was placed into orbit by a modified Jupiter C launch vehicle. The satellite carried James Van Allen's International Geophysical Year scientific experiment which discovered the radiation belt around the earth.

Explorer 1 weighed 30.8 lbs, of which 18.13 lbs were scientific instrumentation to measure cosmic rays, micrometeorites and temperatures. The satellite's transmitter stopped on June 23, 1958.

Launched into an initial orbit with a 224 statute mile perigee and a 1,573 mile apogee, Explorer 1 is expected to decay late in 1969.

Long fight with short stick . . .



Roundup Swap-Shop

(Deadline for classified ads is the Friday preceding Roundup publication date. Ads received after the deadline will be run in the next following issue. Send ads in writing to Roundup Editor, AP3. Ads will not be repeated unless requested. Use name and home telephone number.)

FOR SALE/RENT—REAL ESTATE

For Rent: 4-2-2 in El Lago. Available in March on one-year lease. Central air/heat. Built-in kitchen. Carpets. W. B. Lenoir, 877-1843.

3-2-2 brick in Bayou Chantilly, Dickinson, large family room w/cathedral ceiling and fireplace, formal living room, large master bedroom, laundry, electric kitchen, landscaped, large lot, patio w/gas grill, fenced, carpets and drapes, garden house. Available immediately. Asking \$23,000, 10% down. Harold E. Atwater, 534-5684 for appointment.

Four bedroom, 2 1/2 bath, detached double garage, dining room, living room, family room, morning room, utility room, and all built-in kitchen, wooded lot, fruit trees, fenced, complete drapes and carpeting. Harry May, 427 Willow Vista Dr., El Lago, 577-1152.

FOR SALE—AUTOS

64 VW sedan, black w/red interior, sunroof, whitewalls, radio, tinted front window, clean, 28,600 miles. \$975. Harold Atwater, 534-5684.

59 Volkswagen Microbus, new tires, runs good, excellent camper or work car. \$295 or best offer. Bill Douglas, HU 7-0446.

62 Ford Galaxy 500, extra clean, low mileage, new tires, one owner. \$750. Must see to appreciate. Mike Fox, 427-4967.

56 Plymouth Custom Suburban Station Wagon, V8, automatic transmission, radio, heater, and trailer hitch. Excellent condition throughout. Mario Falbo, MI 5-7093 after 5.

66 Corvette Conv., 427 cu. in., AM-FM radio, tape deck and tapes. Pat McAnally, 473-4952 after 6.

58 Chevrolet station wagon, good running condition, 348 engine. \$150. Frank Wittler, Dickinson, 534-3916.

62 Chev. II 100, 4-dr. standard 6 with air/ heater. Total price \$475. Gloria B. Martinez, OV 6-5307.

60 Olds 88, 4-dr., power steering/brakes, air, radio, heater, very clean. Total price \$400. Gloria B. Martinez, OV 6-5307.

67 Honda motorcycle, low mileage, excellent condition, also car carrier and helmet. Q. Ussery, HU 8-1825.

Leaving Houston and must therefore dispose of beloved decrepit reliable disreputable 1960 Renault, \$100 (?) Llewellyn, HU 8-0736.

59 Triumph TR3, runs good, extra clean, new tires, black paint, telescoping steering

wheel, tonneau cover, boot, convertible top in good condition, side curtains. \$550 or trade for 59-62 VW "Beetle." Will pay all transfer costs. Clayton Pollard, 2530 Violet, Pasadena, HU 7-0024.

65 Grand Prix, clean as a pin, has almost all known accessories, very interested in selling. Paul Penrod, 877-4998.

65 T-Bird, power steering, brakes, windows, seat, door locks; tilt steering wheel, seat belt light, door-ajar light, air conditioning, etc. Yellow-beige color with black vinyl interior. Very clean. Credit Union will lend \$2045 which is whole sale. First \$2045 takes it. Roy B. Parker, 591-2253.

65 Mercedes 190D diesel four-dr., automatic transmission, radio, heater, WW tires, one-owner creampuff. Only \$2,450. A. L. Ball, 944-9964 after 6.

Chevrolet-1964 Biscayne. 6-cylinder, automatic transmission. J. W. Gauldin, HU 8-2715 after 6.

59 Fiat 1100. 4-dr. sedan. Just overhauled. Four good tires, mileage under 60,000. Richburg, 543-4121 Dickinson.

60 Fairlane 500. 4-dr. sedan. Automatic transmission. Air conditioner. Original owner. Richburg, 534-4121 Dickinson.

FOR SALE—MISCELLANEOUS

Interested in Viviane Woodward cosmetics? Flossie D. Leggett, 591-4591 after hours.

61 Chevrolet Engine disassembled and ready for rebuilding, power pack heads and four-barrel, intake and exhaust manifolds. \$65 N. Corbett, ext. 5961 (no home phone).

1960 Glaspar Citation, six individual seats, 75 hp Evinrude, tilt trailer, top and stern cover, extras, excellent condition, \$1250. N. Corbett, Ext. 5961 (no home phone).

Portable heater, thermostat, instant heat, \$6.50. Complete 10-gallon aquarium outfit and wrought iron stand, \$17. Solid oak bookcase headboard, footboard and frame for single bed, \$25. Youth bed, rails and mattress, \$25. All articles in good condition. Richard E. Stanton, 932-2982.

Fly retractable gear with the Aero Club Inc. for MSC and contractors. K-Bonanza, IFR, 195 mph, \$16/hr. wet; Cessna 172 \$9/hr. and 150 \$7/hr.; instructor \$5/hr. Bob Ward, 877-3187.

Trailer hitch for 1963-64 Rambler, \$5. Ted Sampsel, GR 1-0172.

Dining room suit: beautiful oil walnut, styled by Stanley, china closet is 33" wide, has sliding glass doors, buffet, drop leaf table with 12" extension leaf, 6 chairs. All pieces have stain and mar resistant tops. Contemporary style. Excellent condition. \$150. Piano: Small upright, trim lines, antiqued Mediterranean alive, completely reconditioned, beautiful tone. \$185. Table: 44 in. round coffee table by Lane, beautiful wood inlay work in center, plate glass top for protection, oil walnut, original cost \$140, priced at \$45. Swing set: large child's swing set includes 2 swings, see-saw swing, slide and glider swing. Recently painted. \$15. John Lancaster, 932-4654.

Complete amateur mobile station with NCX-3 and d. c. power supply. \$225. Oron Schmick, 534-4242.

Black female miniature poodle. AKC registered. Seven months old. \$45. Al Joslyn, 944-5817.

Kitchen range, full size with griddle, xclnt cond. \$25. J. Rodman, 932-2897.

New 15' Glastron, 100 Mercury, new galvanized Shoreline trailer, plus all ski equipment. F. Borman, 877-2275 (Seabrook).

65 Honda 50 c.c., excellent condition, only 1600 miles, \$170. Mike Loeb, HU 8-2190.

Danish Modern marbletop cocktail table, small console Airline stereo; double bed, complete with mattress, innersprings, very good condition. Also 24" girls bike, 35 mm Argus camera and slide projector and screen. Garcia, 591-2916.

Portable tape recorder, capstan drive, built-in a-c supply. Goodrick, NA 2-8341.

RCA electric range, used 6 months—make offer. 72" German radio control model ME-109. \$25. New 30.30 Winchester—make offer. Gary Wilgus, 474-3918.

Stereo system—Bogen DB 212 amplifier (24 watt); E-V LS-12 speakers with walnut enclosures; Garrard changer (4 speed); 1 album—Kenton's City of Glass. All for \$95. Kennedy, MI 9-1236 after 6.

Sears 23" Silvertone console TV, \$125; Garrard Lab 80 MK II automatic turntable with deluxe elliptical cartridge and base, \$95; Gates cartridge I broadcast-type tape cartridge machine, both record and playback units, \$450. All equipment in excellent condition. F. J. Vancso, 644-777.

Austin-Healey Shop Manual, \$5. Holt's Spoken Russian (6 records and text)—\$35. Toni Zahn, ext. 2311 (no home phone).

Twin beds, headboards, boxsprings and 4-inch foam mattresses \$30 pair; with bed frames \$35. Llewellyn, HU 8-0736.

5-hp Wards outboard engine, 1 yr. old, runs fine, \$70. W. L. Green, MI 3-5034 after 5.

Nine Aeroquipt 2" by 2" slide magazines, all metal, 36 slide capacity, like new, \$7.50. Argus manual slide projector, handles Aeroquipt type magazines, needs rear lens. \$15. John Cotter, GR 2-5039.

35-hp Evinrude block, crankcase, and carburetor with air silencer, \$25. Large canvas convertible top for outboard boat, \$7. John Cotter, GR 2-5039.

Ludwig snare and brass drum, cost over \$200—sell for \$75. Veda A. Basta, 946-4216.

"Heathkit Laboratory Oscilloscope," VTVM, EICO Audio generator, all like new condition. R. B. Lang, HU 8-0149.

Sailboat—El Toro Class, 8 foot Dinghy with dacron sail. Excellent condition. \$150. T. M. Macfarlane, HU 8-2493.

Beautiful, traditional wedding gown, chapel train, size 6, originally \$80, sell for \$30. Rebecca Sykes, 645-7065 after 5.

Ambassador table top portable 16" B&W TV, stand, and built-in antenna, also at no extra cost, outside antenna with 40' leading wire. \$25. R. G. Stevenson, Jr., HU 3-3928; after 4:30 HU 7-2746.

Used furniture of all kinds: beds, sofas, chairs, bunkbeds, lamps, tables, etc. Four Firestone 500 tires 9.15x15 (large car or truck) like new, retails for \$58 each—sell for \$25 each. M. von Ehrenfried, 591-4163.

Piper PA-16, four place family plane, excellent condition, relicensed January 1968, 975 hours total time, 250 hours since major overhaul. Full panel including omni. \$2,600. Fred Laurentz, HU 8-2537.

20 ft. Texas Cat cruiser, completely re-finished, head, deck chairs, boat hook, anchor, lines, etc. Boat is 8 ft. wide and mounted on a custom 4-wheel trailer with spare tire. Twin 75's pushed boat 40-50 mph. A fisherman's or skier's dream at \$1395 (motor not included). B. Wood, 591-2373.

World Book Encyclopedia (deluxe binding) complete with Year Books (4) through 1967. Make offer. Lee Brubaker, 932-4253, after hours except Mon., Wed.

WANTED

Wanted: Bachelor roommate to share modern 2-bedrm, 2-car garage house in Dickinson, Oron Schmidt, 534-4242.

Good used upright freezer. M. von Ehrenfried, 534-4242.

Wanted—ride for daughter between Clear Lake City and University of Houston. L. Hammer, HU 8-1030.

Wife of NASA employee would like to join or form a carpool from the Apollo Zone to Galveston. Mabley, HU 8-3241 after 5.

Male or couple to share private home in quiet residential section. L. Palmer, 877-1269 after 6.



BLOOD, SWEAT AND SALUTES—Two members of the Clear Creek Country Theater production of "Blood, Sweat and Stanley Poole" rehearse standing tall in the old supply room and throwing highballs. At left is Bill Milligan of the Engineering and Development Directorate staff office who plays the title role of Lieutenant Poole. David McCormick, right, of UHF-TV Channel 39 plays the second lead part of Sergeant Oglethorpe.

Drudgery of Army Life Is Plot of Theater Play

James and William Goldman's three-act comedy, "Blood Sweat and Stanley Poole" will have its Houston-area premiere February 8 when the Clear Creek Country Theatre begins a six-performance run of the play. Morgan Redmond, B&R-N employee in the Space Environment Simulation Laboratory, is directing the production.

Redmond has acting and directing credits in the US, Ireland and England.

"Stanley Poole" is set in an antique Army post in a remote part of the United States. New regulations on minimum education requirements for officers and non-coms throw a kink into the stagnant quo at the post. Middle-aged first louie Poole, a supply room officer, does not have a college education and his long-time sergeant friends never finished high school.

The post education officer shakes them down for money, which they pay so that they may stay in the Army. But to the rescue comes college grad Oglethorpe, a bumbling misfit just out of basic, who tutors the supply room troops to pass the education requirements.

Lieutenant Poole is played by Bill Milligan of the Engineering and Development Directorate

staff office. Milligan had parts in three earlier Country Theater productions — Sheriff File in "110 in the Shade," Alfred in "My Three Angels," and wild-West show manager Charlie Davenport in "Annie Get Your Gun."

Second-lead Oglethorpe is played by Dave McCormick, UHF-TV channel 39 assistant art director, who has appeared in numerous Houston area little theater productions.

Most of the other parts are played by MSC support contractor employees. Jack McGurr plays Pfc. Rooney and is with Lockheed Electronics. The sergeants are played by Cec Kelly, GE, Greg Adams, Philco, Don Wiseman, AV Corp., Ron Woods, Union Carbide, Bob Bruce, Northrop, and Harriet Engleke, wife of a Clear Lake City lawyer.

Other parts are University of Houston radio-TV student Jim Carmichael as Captain Malcolm, Bristol Labs employee Dave Miles as Colonel Egan and housewife Sonnye West as Mrs. Bucci.

Tickets for February 8, 9, 10, 15, 16 and 17 performances of "Blood, Sweat and Stanley Poole" are on sale at the Theater in League City at \$2 each for adults and \$1.25 for students. Reservations can be made by calling the Theater at 932-3714.

Go Texan

Mr. Groundhog Knows Not How He Got His Job

Whether we shall have an early spring or six more weeks of winter will depend upon what Mr. Groundhog sees when he pokes his head out of his burrow today. Tradition has it that if it is sunny and he sees his shadow, there is still six weeks of winter. But if it is cloudy and/or foggy and he casts no shadow, spring is just around the corner.

Mr. Groundhog likely wonders how he got saddled with the job of weather prognosticator. Pitted against weather satellites and all the latest in meteorological techniques, he probably feels rather inadequate.

But after today he can revert to one of his other aliases in which he can regain some degree of anonymity — woodchuck, marmot — and not feel the burden of blame for what the weather is doing.

Do your share for Freedom!



Sign up for SAVINGS BONDS NEW FREEDOM SHARES

15-Year Man



Isaac Diaz MSC White Sands Test Facility

Cork Club Deal Offered by EAA

Through a special arrangement with the Cork Club in Houston, club memberships applications are available from the MSC Employee Activities Association. Initiation fee is waived and monthly dues are set at \$6 for those persons accepted.

Cork Club applications are available from Mary Sylvia, Room 485, Bldg 2.

Next Lunar Photographer: Man



LUMPY TERRAIN—Surveyor VII's wide-angle television camera January 9 relayed back to Earth this photo toward the northeast horizon. The horizon is formed by a ridge characteristic of the undulating topography on the flank of the crater Tycho, some 18 miles to the south. The rocky debris is Tycho ejecta.

GETS HIGH MARKS—

Lunar Module Proves Maturity As First-Flight Data Sorted Out

Quick-look grading of the Apollo lunar module's first flight test gives the spacecraft high marks.

In their first comprehensive report to program officials, engineers evaluating data said Sunday the January 22-23 mission was completed successfully. Ascent and descent propulsion systems and the ability to abort a lunar landing and return to orbit were demonstrated.

Program officials were especially pleased with the maturity of the spacecraft's hardware. They had expected more problems in the unmanned first flight of a vehicle designed to be manned.

Studies to date indicate that the lunar module showed more maturity in its first flight than many previous spacecraft, including some designed to be manned.

A detailed review of the mission will continue for several weeks, but no major problems are apparent.

Cited as examples of excellent performance are the sublimator, or water boiler, in the environmental control system which extracts excess heat from the internal environment; the re-

action control system; and instrumentation.

Overly conservative programming of the lunar module guidance computer (LGC) caused the early shutdown of the first descent propulsion system (DPS) burn. Data indicate there were no problems with the engine or with the computer itself.

The first DPS burn was commanded at 03:59:40 mission elapsed time. The LGC initiated shutdown 4.3 seconds later when the computer determined that the required velocity change had not been achieved in the time allowed. At shutdown, thrust had built to 9.5 per cent. A 10 per cent thrust level burn was planned.

Premature cutoff of the burn resulted in flight controllers shifting to a previously planned alternate mission. This mission, called the minimum requirement sequence, was one of many possible pre-planned alternatives for LM-1 designed to guard against malfunctions. This particular sequence was designed nearly two years ago to meet all of the essential objectives of the LM-1 flight. Major differences between the planned and alternate missions were deletion of a long DPS burn (12 minutes) and substitution of program reader assembly (PRA) control for primary guidance control during propulsion burns.

The second DPS burn was commanded at 06:10:43 elapsed time. Duration was 26 seconds at the 10 per cent thrust level, followed by 7 seconds at maximum thrust. Performance was normal except for an engine shut-off valve indication. When the engine was throttled to a full thrust, instrumentation indicated that not all of the four valve actuators were fully open. However, thrust chamber pressure was normal, indicating a possible instrumentation problem.

The third DPS burn was initiated 32 seconds after completion of the second burn. The sequence consisted of 26 seconds at 10 per cent thrust, 2 seconds at maximum thrust, and abort stage fire-in-the-hole, where the two stages are separated and the ascent stage engine is ignited simultaneously while the DPS is being shut down. DPS performance appeared normal.

Duration of the first ascent propulsion system (APS) burn during the abort staging was 60 seconds. No problems were encountered.

Spacecraft control was then returned to the primary guidance system for the second APS burn. However, excessive reaction control system (RCS) thruster firings began immediately. It was determined that since the digital autopilot was in an idling mode during PRA control, the system computed RCS commands based on prestaging inertias, which led to excessive RCS propellant usage. Subsequent ground simulations verified that RCS propellant usage

was normal for the existing conditions.

The temperature measured at the water/glycol pump inlet reached a maximum of 56.2 degrees F prior to water boiler start-up at three minutes after lift-off. It stabilized within one revolution at approximately 40 degrees F for the remainder of the mission.

Cabin pressure sealed off at 5.4 pounds per square inch about 12 minutes after lift-off. Cabin leak rate was 0.4 pounds per hour at 5 psi as predicted.

The communication system appeared to operate satisfactorily throughout the flight. VHF telemetry contact was maintained during all available coverage.

The instrumentation system which furnished data on the fire-in-the-hole abort surpassed expectations and provided very significant data during the most critical part of mission.

Engineers had been concerned that the ascent engine plume striking the descent stage during separation might impinge on antennas, causing information to be lost or garbled for a time. However, the pulse code modulation, or digital telemetry, continued uninterrupted. Only minor dropouts were experienced in the four FM/FM, or analog telemetry, links, and not all of them dropped out at the same time.

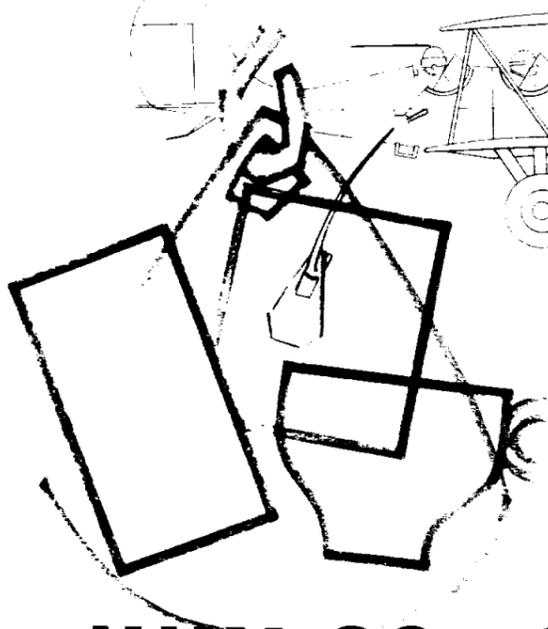
Both the Corpus Christi, Texas, and Guaymas, Mexico, tracking stations monitored the abort staging. Data from the Texas station have been reviewed. Tapes from the Mexico station are expected soon and will provide engineers with an important second look angle of the event.

The situation caused the RCS to operate well beyond its normal duty cycle, and system temperature limits were exceeded. Despite that, the RCS operated properly later in the mission. Engineers consider the situation an extra plus sign for the RCS, pointing out it proved itself better than if the mission had been nominal.

Insufficient time to properly set-up the primary guidance system and limited coverage by ground stations in the next revolution resulted in a decision to conduct the second APS burn under PRA control. The burn was started at 07:44:19 and was allowed to continue until fuel depletion, approximately 6 minutes.

The spacecraft was rate-stabilized in a retro attitude during the second APS burn, and the best information available at this time indicates that LM-1 ascent stage reentered the atmosphere west of Hawaii during the sixth revolution.

Vehicle structural integrity was maintained throughout the mission. There are no indications of any thermal control problems, and the environmental control system appears to have functioned properly.



Lou Reichers and Bob Black took off from a New York airport in a bold attempt to establish an all-time record; one month in the air - without a landing.

During the more than 313 hours they were aloft, a "mother ship" replenished supplies, lowering to them creamed chicken, rolls, coffee, and other foods comprising 39 full meals.

The Reichers/Black endurance run was a spectacular accomplishment in its time, but pales in comparison to Apollo's lunar mission.

JULY 22, 1930

In deep space, astronauts will encounter no supply ships, filling stations, or trading posts.

All provisions for the week-long flight must be on board before launch.

Food must be available when needed . . . but then so must other things - such as reliable flight systems.

We have a fundamental belief that there is no such thing as a random failure.

If a system is designed, built, and tested properly, it will work, as it should - when it should . . . even 250,000 miles from home.



KEEP **NASA** THE SYMBOL OF EXCELLENCE
MANNED FLIGHT AWARENESS
APOLLO